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DEFENSE INDUSTRY MANAGEMENT OF INDIRECT COSTS

INTRODUCTION

Thus far, we have discussed certain background information essential for understanding the subject of indirect costs. The reader must comprehend by now that these costs are extremely difficult to control and that a great deal of management attention, structure, and a disciplined business process is necessary to effectively control the costs. The essential elements for developing all overhead rates, that is, the direct allocation base and the indirect expenses for each cost pool, are developed by industry in a very disciplined manner as an integral part of the corporate business planning process. This planning process is initiated and controlled at the very top level of the corporation. Defense contractor managers strongly emphasize that a thorough understanding of the planning process is essential for grasping the development and use of indirect rates in industry. Essentially, the approach is to set out specific quantified objectives and then to follow a disciplined management decision-making process to derive rigorous budgetary data, including the data necessary for managing indirect costs.

The business planning process represents a set of top management decisions that focus on what the corporation will do to be successful and how it will do it. The corporation addresses a broad range of very significant issues, among them the goals and objectives of the corporation, manpower targets, engineering load projections, make versus buy decisions, investments in capital equipment, facility requirements, manufacturing schedules, inventory levels, discretion-

ary bid and proposal levels, independent research and development expenditure levels, and financing needs. Demonstrating the importance of this corporate planning process, in many companies, top managers make no outside commitments during the important phases of business planning. The business planning process results in the preparation of a mathematical model of the total corporation; therefore, the specific allocation bases and indirect expenses for all overhead rates, in effect, “fall out” of this decision-making process.

The control system for managing indirect costs must be thought of within the framework of the corporate organizational structure and the levels of responsibility within that structure. Defense contractors will differ notably as to the terminology used to designate various organizational levels within their corporation. For example, a branch or division could represent the top manufacturing organization in one company but a much lower level in another company. However, there are three rather common organizational terms, referred to as certain “centers,” that can be used generically in industry to designate responsibility levels. The corporate office is an “investment center,” which is the center with responsibility for making major decisions such as product line or facility investment. A major division or business segment of the corporation is a “profit center,” which is the center with responsibility for controlling price, volume, and cost for specific products. A “cost center” is the lowest level within a business segment where a manager is held responsible for controlling the cost of spe-

cific activities. For example, a machine shop may be a department within the fabrication division of a large defense manufacturing contractor. The machine shop may contain various groups of machines such as lathes, punch presses, and milling machines. Each group of machines may be designated as a separate cost center with its own supervisor. The supervisor of the cost center is responsible for minimizing costs in that cost center. Typically, a large defense contractor may have more than a thousand cost centers at one plant location within a given business segment. Although costs are identified to specific cost centers, the managerial focus on developing and controlling indirect rates is usually at the business segment or “profit center” level.

The output of the business planning process at the profit center or business segment level is a specific set of managerial documents that provide a logical, rational sense of direction for the business segment. These managerial documents also provide a basis for guiding and evaluating the corporation’s accomplishments. See Exhibit 10, “Business Planning Process Outputs,” for an example of typical managerial control documents that would be produced during the planning process and would become a part of the operating plan for a business segment. Note that the names defense contractors use for their operating plans vary (e.g., profit plans, blue books, master budgets, management budgets, annual operating plans). We will use a generic term, operating plan, in our discussion.

There are four processes that are performed by the corporation in a logical and disciplined fashion, that lead to managerial control of indirect costs through the development of the operating plan: the planning process, the forecasting process, the budgeting process, and the control process.

PLANNING

The first step in the planning process, which is a very high priority task for top management, is the development of the corporation’s strategic or long-range plan. Strategic planning refers to the process of developing goals and objectives for each business segment and the strategies to be used in attaining them. Strategic studies are often made by the corporate office in cooperation with its business segments. Outside consultants, who have certain critical knowledge of products and markets, may be used to assist management. The strategic plan provides general direction for a five- to ten-year period (in some corporations longer). The strategic plan forms the basis from which a more detailed plan, encompassing a shorter period and which we will refer to as the operating plan, is developed.

Due to the lengthy developmental nature and complexity of defense products, long-range planning is very prevalent in the aerospace/defense industry. Sound business practice requires future products to be carefully targeted for investment. Production often requires the design and construction of new, large facilities. It often takes very long lead times for the development of raw materials and components that are pushing the state of the art. In addition, because of product improvements resulting from engineering modifications, it is not unusual for defense products to have product life cycles of a decade or more. Therefore, defense contractors must carefully select their product areas and map out a long-range plan to assure success. Management must be continually assessing and evaluating what the corporation is currently doing in relationship to its dynamic operating environment. For example, management is asking itself the following very important questions:

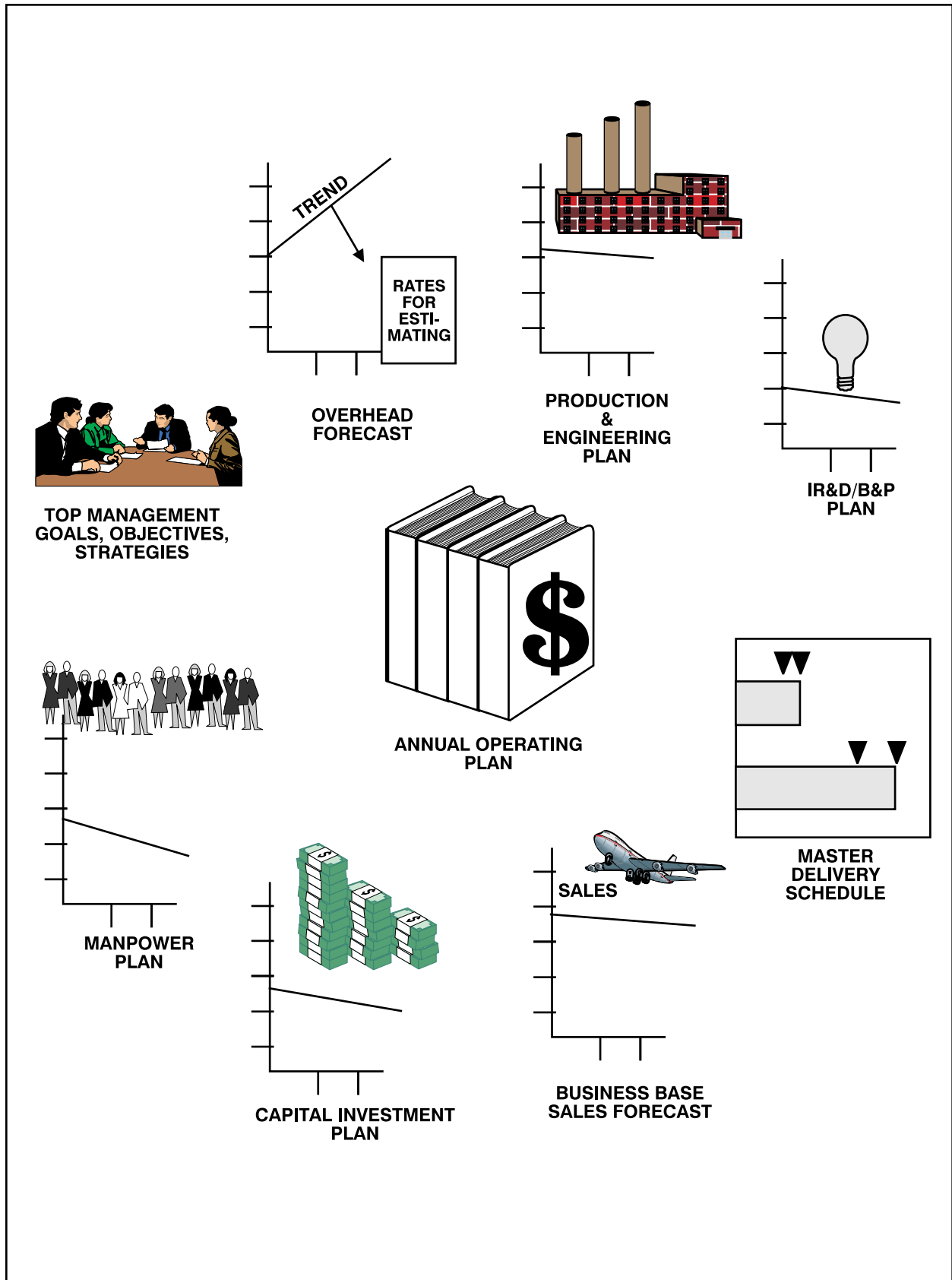


Exhibit 10. Business Planning Process

- What do we want to be in the twenty-first century?
- Where are we now and where are we going?
- What are our core competencies?
- What are the needs of the market place?
- What future threats are out there? How do we meet them?
- What happens if we don't?
- What competitive advantages do we have or need to develop?
- What are reasonable objectives for us to achieve?
- What is in the way?

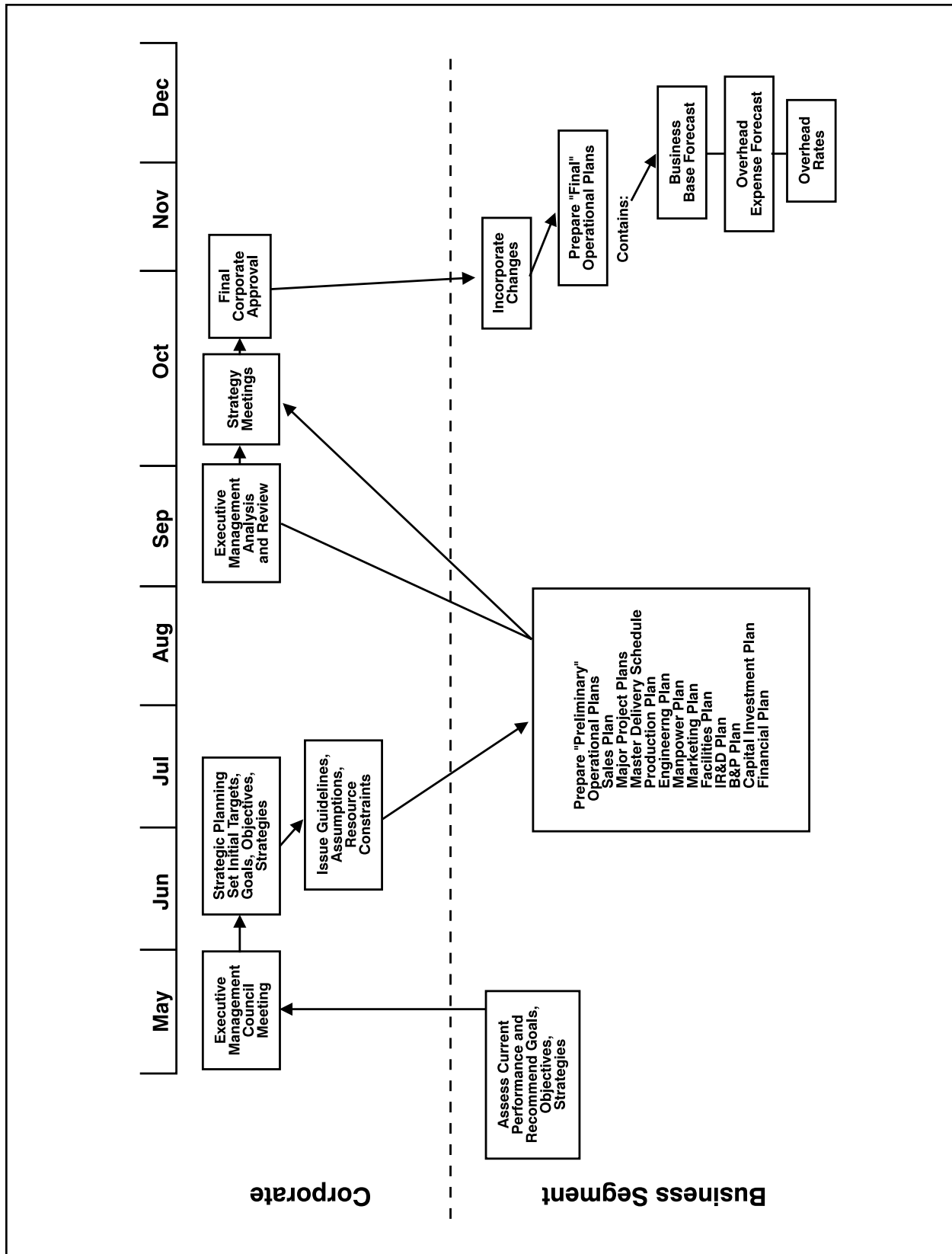
Essentially, the strategic planning task is one of researching and identifying the right businesses to ensure future growth by developing and marketing the right products.

Long-range planning by defense contractors requires an integrated team comprising many business disciplines, including marketing, engineering, manufacturing, quality, logistics, human resources, finance, and research. The goals, objectives, and strategies for attaining them must be consistent across all functions and provide a clear sense of direction. A typical long-range plan will contain information on predicted sales and profit trends by major product line, new product lines, new acquisition plans, diversification plans, planned new facilities, manpower requirements, and research and development plans. Strategic planning is a continuous process; as significant developments occur, they are incorporated into the long-range plan. Formal updating or revision is done by many

companies on an annual basis. Each year, one year is dropped and a new one is added. The result of the long-range or strategic planning process is the establishment of a planning baseline from which near-term operating plan projections are derived; these are essential for effective management of indirect costs.

Each year prior to the start of the corporation's annual planning cycle, the corporate office or investment center establishes a uniform planning framework and issues instructions about the format and content of each planning document to be included in each of the business segment or profit center operating plans. The corporate office or investment center ensures that each of the business segments fits into the overall plan that achieves corporate objectives. In order to achieve consistent inputs from all business segments on a timely basis, a calendar of events is normally prepared by the corporate office. See Exhibit 11, "Business Planning Process—Typical Defense Contractor," for a conceptual example of the corporate and business segment responsibilities as well as the sequential flow typically found in formulating the business segment operating plan. Note that detailed planning for the next fiscal year, which in this case is the calendar year, actually begins eight months earlier with the assessment of current performance and recommendation of goals, objectives, and strategies. While the corporate office issues guidelines to the various business segments, there is considerable involvement in planning, with recommendations coming from the heads of the business segments and their key managers.

Industry program managers are typically very involved in the business planning process and are key suppliers of data relevant to their weapons systems for business planning purposes. The planning process includes considerable negotiation with corporate management. Both corporate and business segment management



**Exhibit 11. Business Planning Process – Typical Defense Contractor
(Prior to Start of Business Plan Year)**

want to ensure that the operating plan is logical and achievable. It should also be challenging: it should promote the maximum utilization of corporate resources. Final approval of the plan by the top corporate management occurs before the start of the fiscal year. Once approved, the details of the operating plan become the basis for measurement of management's performance against its objectives.

Defense contractors usually prepare operating plans for each business segment for at least a three- to five-year period. A typical five-year operating plan covers the forecasted sales and profits projected by the business segment for the first 12-month period by month, the next year by quarter, and the last three years by year. The plan states the results to be achieved in quantitative terms and sets specific frames for accomplishment.

The importance of the outputs of the business planning process for the management of indirect cost cannot be over emphasized. While business segment goals can sometimes be broad and philosophical in nature, business segment objectives are very specific and measurable. For example, goals may cover such things as the basic mission or purpose of the organization, breadth of product line, product quality, growth expectations, responsibly to shareholders, social responsibilities, or to fix, sell, or close any business segment that is not number one or two in their market. Business segment objectives bring the goals into sharper focus by quantifying the goals, designating responsibility, and establishing specific time dimensions for attaining them. Examples of these might be: achieve sales of \$1 billion in 1997, increase profit by \$18 million in 1997, achieve a rate of return on investment of 14% in 1997, or reduce the manufacturing overhead rate by 15% by the end of the second quarter of 1997. Targeted "affordability" rates for overhead are sometimes set by top management during the planning pro-

cess and often become specific objectives. While a strategic plan is broad and general in nature, the operating plan is detailed and specific, for it becomes the budget or control tool for managing overhead in the near term. Further, management compensation is often tied directly to business segment objectives, which often include overhead reduction targets, and consequently, the objectives have very strong motivating power.

After the basic goals and objectives have been determined, the next step is to map out the detailed, integrated strategies for achieving the objectives. Several different types of strategies are required for the business planning process: marketing, manufacturing, research and development, human resources, and financial strategies. Each strategy is highly interrelated with the other strategies, and it is critical to the success of a business plan that each strategy be consistent with other strategies.

A market strategy addresses the issues of: Who are our target customers? What products will we sell to them? What will be the types of contracts and pricing methodologies? Will we enter the foreign military sales market? Will we participate in teaming arrangements with other contractors? Will we lower price to increase business volume?

A production strategy addresses the issues of: What process and technology will we use to design, develop, produce, deliver, and support our weapons systems? How will we meet the requirements for materials, equipment, and production skills? Will we make or buy certain components? Will we make improvements in our weapons systems to increase capabilities? Where will we locate our facilities? What level of capital investment will be necessary?

Because of rapid, frequent, and expensive changes in technology, research and develop-

ment costs are very significant costs contributing to high indirect cost rates in the defense industry. Consequently, defense contractors place very heavy weight on the research and development strategy and they must carefully plan expensive research and development projects. This strategy addresses these issues: What are the essential areas that must be maintained or expanded in order to have a competitive edge? What investments in technology are necessary to maintain or expand the competitive edge? Will we collaborate with others through joint ventures in order to share development costs? Will we purchase certain data rights to enable us to enter a given market?

A human resource strategy addresses the following issues: Do we have the necessary talent or will we need to recruit? How will we train the work force to be properly certified to perform new manufacturing operations? How will we negotiate wage rates with the union? How will we provide research personnel to develop new materials within the required time frame? How will we conduct salary and wage reviews? How will we structure our fringe benefits for professional employees in order to be competitive? Will we need to lay off personnel? If so, will we make employee severance payments?

A financial strategy addresses these issues: How will operating and investment fund requirements be generated? Will we lease or purchase facilities? What will be our financing structure: debt or equity? How will we generate a reasonable return on our investment? How will we minimize our investment in total assets? How will entering foreign markets affect taxes? How are we going to contain health care costs? Will we have an employee stock owned plan? The development of a financial strategy becomes a highly interactive process with the development of other business plan strategies because any

change or modification in other areas will necessarily have financial impact.

It should be emphasized that the development of the operating plan for the business segment (Exhibit 11, "Business Planning Process—Typical Defense Contractor") is a highly iterative process. Business segment management recommends certain tentative goals and objectives, based on guidelines, along with certain assumptions and conditions, developed by the corporate office. After considerable review and analysis, the plan is judged to be satisfactory, or not. For example, if forecasted sales do not cover estimated production and operating costs, then sales goals may be adjusted upward or indirect cost-cutting actions may be planned. If still unsatisfactory, the iterative process will begin again until an acceptable plan is developed. Each business segment's objectives and strategies will vary, but the operating plan for each segment will spell out in specific terms the performance objectives for the segment and provide clear, overall indication of how the objectives will be accomplished.

Summarizing and integrating all elements of corporate and business segment planning into one document, the operating plan is the written end product of the business planning effort, and it has both internal and external uses. Internally, it is used to communicate to management and staff the clear expectations regarding performance. In addition, the operating plan and the process of developing it are used to educate and motivate key managers in the corporation. An operating plan also has several uses in relationships with significant parties outside the firm. Since an operating plan communicates planned actions, it can be used to assist in securing funding from outside sources, either creditors or stockholders. It is important to note that the operating plan contains highly proprietary data and any decision to release it or any parts thereof to parties outside the corporation is a decision

of top management. Often, the number of copies is limited and distribution is closely controlled by management. Government personnel who have access to data in a contractor's operating plan must be aware of the highly proprietary nature of the information contained in the plan, such as forecasted indirect rates.

FORECASTING

There is probably no other business process performed within a company that is more important to the control of indirect costs than that of the forecasting of future sales. It is absolutely essential for a company to have an accurate and well-disciplined process for estimating sales, as this process leads to the projection of the all-important business base. The projection of the business base is the starting point in preparing the details of the operating plan and it is the primary driver in establishing indirect cost requirements. Since indirect cost pools include variable as well as fixed costs, indirect costs are variable to the business base projections. Consequently, an erroneous sales forecast can cause a company to get into serious indirect cost control problems.

Once the sales forecast is complete, the direct allocation bases and the indirect expenses for each overhead pool can be estimated. However, a reasonable attempt cannot be made to estimate indirect expenses in each pool until a solid estimate of the business base has been tied down. Usually, detailed indirect pool expenses are not estimated until about a month after the sales forecasting process is completed.

In order to understand indirect cost management in the defense industry one must thoroughly understand how defense contractors establish the sales forecast. The sales forecast means the total sales dollar volume, which includes both commercial and government sales. Arriving at a sales forecast is a difficult task,

typically involving inputs from hundreds of people in a large company. The process is similar to a large proposal effort and requires very close coordination and control. A "bottoms-up" approach is often necessary because of the highly varied nature of the products and services marketed. The sales forecasting process is usually managed by the vice president of marketing or vice president of finance with guidance provided by top management. Industry program managers routinely provide certain baseline information relating to their programs, such as estimates at completion, forecasts of head count, and time-phased expenditure plans, which are very valuable for use in developing sales forecasts.

The sales forecast is formulated through the analysis of data, in sequential fashion of the expected performance of the economy, industry, corporation, business segment, product line, and individual products and contracts. Several mathematical techniques are often used in estimating sales (such as trend extrapolation, simple and multiple regression, and expected value analysis). Because of the volatile nature of the defense business, management judgment plays a very significant role in estimating sales for defense contractors. Since historical weapons systems data is often not representative of the future, mathematical forecasting techniques are not as widely used as in a large commercial marketplace. Consequently, a bottoms-up approach with a heavy emphasis on the judgment of certain key managers is predominantly used in the defense business for forecasting sales. At the present time defense contractors have exceptionally difficult problems in forecasting future sales because there are so many unknowns in the current downsizing environment. Even though contractors deal with many program offices, in effect the U. S. government is the defense contractor's sole customer. Consequently, political considerations often play a major role regardless of the general economic

and industry forecasts (e.g., current debates on missile defense and submarines).

Using a bottoms-up approach, defense contractors typically develop their sales forecast through an analysis of their backlog along with projections based on managerial experience and judgment. For contractors engaged primarily in large-scale manufacturing, the buildup of the master production schedule is essential, because the key ingredients for the sales forecast are the number of items to be delivered and when they are to be delivered. One method used in near-term projections is to stratify the estimate into firm, near-firm, anticipated, and potential business. Firm business consists of commercial contracts or purchase orders and government contracts that have been funded and committed to planned production. Firm business orders are referred to as “backlog.” Near-firm sales volume is volume that under normal conditions, can be expected to come to the company, but that is subject to some further action by the customer. Examples of such near-term business are priced government and commercial options in existing contracts, contracts negotiated but not signed, and any purchase orders subject to contingencies. The sales forecast also includes certain anticipated business that the company expects to perform based on prior history. An example is follow-on spare parts for supporting military products where the total requirements of specific programs or products have not yet been defined. Most commercial products fall into this category, as they usually have a history of large continuous sales. Identified new business includes sales that may be expected to result from outstanding bids and proposals. Many companies use historical statistics to determine the percentages of wins that will probably occur against a known number of proposals being submitted.

In the case of forecasting sales on very large programs, some companies use a discounting

concept on anticipated future contract values based upon “go” and “win” factors. A probability of “go” is assigned after identifying key issues of a political or funding nature that affect the success of the program. Factors considered by management in assigning probabilities include budget trends, national need, congressional support, and user acceptance. A probability of “win” is assigned based on factors such as the company’s strengths and advantages relative to its competitors, technical capability, price competitiveness, and experience. The resultant sales forecast for such large programs will be extremely important in establishing overhead rates for future years.

The sales forecast is refined through a series of senior management reviews. Since the accuracy of management judgment is so critical to sales forecasting and a tremendous amount of detailed planning is dependent upon the sales forecast, management must thoroughly test the accuracy of the forecast against meeting assigned objectives. While a large number of people are involved in making inputs for the sales forecast, a very small number of top management people are involved in actually determining the final number that will represent forecasted sales volume. With experience, top management learns how to modify the sales forecasts of lower level managers. If some program or division managers are always overly optimistic in their forecasts, this will be taken into account in preparing the business segment sales forecast, with the opposite type of adjustments made for inputs from more conservative individuals. Because of the crucial importance of the sales forecast and uncertainty in forecasting, top management will often use outside consultants to provide an independent assessment of certain forecasts, particularly on large, costly, developmental programs. Once the sales forecast is complete, the translation of the sales volume into direct cost allocation bases for computing overhead rates is accomplished, primarily

through the use of historical statistical data along with engineering estimates.

Sales forecasts are assessed continuously during the year for impacts of changes to the business base or indirect expense forecasts. Monthly comparisons are usually made of actual results to sales forecasts and monthly or quarterly sales forecast revisions may be made, usually in conjunction with quarterly corporate reviews. This provides management with the latest projections of current business volume and strengthens the planning and control of indirect costs.

It should be emphasized that sales forecasting information is highly sensitive, private data that could be very damaging if it fell into the hands of some outside the company. Typically, the information is closely controlled by the company and is given out to a very limited number of personnel who have an absolute need to know. Government personnel who may have access to sales forecasting data must ensure that it is closely protected.

BUDGETING

The detailed indirect cost budgeting process can commence once the sales forecasting process has been completed and tentatively approved. Key to the development of reliable indirect rates is the establishment within the company of a rigorous budgetary control system with maximum participation by managers in the entire company. Generally, the responsibility of forecasting overhead expenses resides with a designated overhead pool manager with lower tier expense budgets developed at the functional manager level. Commitments are then made to the overhead pool manager to manage to the budgeted amounts. This process ensures ownership of the overhead budget at the lowest level of the organization.

Typically, overhead pool managers are members of upper management, often at a vice-presidential level, who are responsible to the president of the business segment for the control of overhead rates (i.e., the vice president of engineering is responsible for engineering overhead, the vice president of operations is responsible for assembly overhead). Generally, the president is responsible for general and administrative expenses. Also, because of the large dollar amounts and discretionary nature of the expenses, the president is often responsible for independent research and development and bid and proposal expenses. In some cases, at the outset, top management will furnish, along with business base projections, “overhead target” rates—rates that must be competitive with others in the marketplace. This technique is referred to as a “top down” management approach. Subsequently, through the implementation of the company’s budgetary process, detailed overhead budgets are established within each pool at the lowest organizational level, using a “bottoms-up” approach. The detailed budgets, when finalized at the functional and manager levels in each overhead pool, will constitute the primary control mechanism of the overhead process. Budget planning and control systems vary among companies and among business segments within a company. Hence, we will discuss the systems broadly so that they will be applicable regardless of the differences among companies’ organizational structures and accounting systems. The process used by defense contractors to establish detailed organizational overhead budgets typically comprises five separate phases: the budget call, budget submission from organizational units, a negotiation phase, a senior management review phase, and the performance measurement phase.

The top official in the financial function, usually the vice president for finance, normally will have responsibility for coordinating various

budget efforts. Within the financial function, it is usually the responsibility of a budget control group to generate budget proposals and coordinate the process for the development of overhead budgets for each organizational element. But it should be emphasized that the budgetary process constitutes a general management decision-making process and is not solely a financial function.

The annual budgeting process usually begins with a meeting held by the budget control group and attended by a representative from each department. At that time, the departments are presented with an overview of the budget process and its relationship to the other business segments and corporate plans. Each department is given a budget package to help it develop a budget request. Typically, the information in the package includes a detailed schedule of the budget process, estimating parameters to be followed such as sales forecasts, business base forecasts, labor rates, annual merit increase percentages, fringe benefits rates for hourly and salaried employees, year-to-date actual overhead expenses by account, year-to-date head count, direct employee versus indirect employee targets, and company unique pro forma budget input sheets to be used. Each departmental manager is tasked to prepare a proposal of its annual budget needs.

In effect, subordinate managers estimate and request the resources required to support the forecasted level of sales. Budgets are prepared for every unit of authority down to the lowest level of budgetary accountability, commonly at the department level. Again, this level of authority can vary by company. Until approved by top management, budgets are considered to be only requests.

It should be noted that the control of an indirect cost is usually the responsibility of the organizational unit manager for whom the cost is

budgeted. Such allocated indirect costs as depreciation, taxes, insurance, fringe benefits, rarely can be controlled by an operating department, hence, they are usually not held responsible for the budgets allocated to their department. So the assignment of cost responsibility may not always agree with cost allocations. For example, the cost responsibility of service departments are the responsibility of the department heads (e.g., industrial engineering, data processing, print shop). Budgeting for those service costs that the operating departments can control (e.g., volume of data processing services used) should be the responsibility of the operating department managers. But they would not be responsible for the amount of indirect materials used by the service departments. As an additional example, the indirect labor cost of the payroll department is controllable by the supervisor of that department. It is commonly considered to be a noncontrollable cost in the case of the factory supervisor who is charged with a prorated amount of the payroll department costs.

Indirect expense or overhead forecasts are made by responsible managers or their staff using various estimating techniques such as projections from actual experience, trend analysis, comparative analysis, manpower factors, change analysis, “grass roots” buildup using analysis of required tasks, and base variability analysis. Of primary importance in forecasting indirect expenses is an analysis of indirect labor. An evaluation of the necessity for each indirect employee through an analysis of the tasks to be performed should come before any evaluation of the cost to perform the function. Each organizational manager usually prepares and documents estimates of all indirect expenses in the detail necessary to support a reasonable and complete forecast of overhead by month, by year, and by major indirect cost element. The “bottoms-up” overhead forecasting process results in a strong commitment to achieve the

budget and a willingness to accept the results since the subordinate managers were very involved in the decision-making process.

Overhead pool managers, with the assistance of their staff, are responsible for assessing the reasonableness of the overhead estimates requested by the various organizational managers who are inputting indirect cost into their overhead pool. An assessment is made by overhead pool managers to understand customer requirements, significant cost drivers, optional resource assignments, and optimal resource use. The assessments made by overhead pool managers enable them to exercise the necessary control of costs and to have every opportunity to achieve or out-perform budget targets. Their assessment will also identify management reserves and challenges.

Typically, once all budget requests are received by the budget group in the finance function, a company overhead distribution system is run to “roll up” the proposed budgets and to develop preliminary budgeted overhead rates. An independent assessment of the budgetary estimates is then made by the budget group. Concurrent with the organizational estimating process, the budget group has usually developed its own overhead projections using various statistical data. The purpose of these independent estimates is to challenge the reasonableness of the various budgetary requests, to ensure consistency with other planning and forecasting assumptions and conditions, and ensure linkage with other key plans, such as the sales forecasts, manpower plan, and capital plan. Some contractors have found the use of budget review committees very useful in strengthening the budgetary process. In effect, subordinate managers are required to present and justify their budgetary requests to a committee comprising senior company managers.

As a result of independent reviews and challenges, negotiation with managers is conducted, changes are made if appropriate, and recommendations are made to senior management for acceptance of the results to be used as the forecasted indirect rates for the company. If differences cannot be resolved through the internal negotiating process, the matters are referred to top management for a decision. If the budgetary process works as intended, the recommendations to top management represents a joint effort of the operating organizations and the financial function.

Top management reviews the recommended indirect rates to ensure affordability and to obtain a definite commitment from overhead pool managers. Management wants to ensure that the forecasted rates are competitive, reflect maximum cost containment measures, and include significant challenges for each functional area. Most important, if management is not satisfied that the rates are competitive, the forecasted rates are not approved and subordinate managers are directed to cut overhead costs. The process starts over again. In some cases, management places upper limits on the rates, to ensure competitiveness. In order to achieve reduced rates, each functional area must find new, different, and more efficient ways to perform its tasks. Consequently, more often than not, the budgetary process for establishing overhead rates constitutes both a bottoms-up and a top-down approach.

After approval by top management and inclusion in the business segment operating plan, the estimated business base and indirect expenses become the basis for overhead budget allocations to the operating organizations. The budget allocations are flowed throughout the company to the lowest level of managerial control desired by the overhead pool manager. Overhead pool managers may establish a reserve in order to ensure that results are achieved within

the budget. Such a technique is sometimes referred to as “motivational budgeting”: management will set very tight overhead budgets in order to motivate better performance and encourage cost reductions. The detailed allocated budget becomes the primary control mechanism in the overhead process as it, in effect, constitutes the delegated authority to incur overhead expenses. Budgets are time-phased by month and broken down by specific indirect cost accounts for each department. By planning at this level of detail, each manager has a tool to measure and control the activities for which he is responsible. As we will discuss later, overhead rates are subsequently monitored continuously and revisions may be made at any time that a significant change occurs in either the forecasted business base or in forecasted indirect expenses.

The indirect cost data developed in the budgetary process is highly proprietary data and usually is distributed only to executives and top-level managers. Lower level managers usually receive only budgetary data for which they are responsible. However, this data may be shared with government customers for their evaluation of indirect rates used for government contracting purposes. We will discuss government involvement in estimating indirect rates later under the subject of forward pricing rates, where a large number of government rules come into play.

CONTROL

Once actual work begins, the business enters a new phase: the budget becomes the tool for controlling indirect costs. So the management of indirect cost requires the contractor to plan in advance what the costs should be and hold actual costs in line with the plan or justify any differences. This control requires discipline and it is up to management to establish a highly disciplined cost control environment. It should be

realized that people, not reports, control indirect costs. Typically, any specific indirect cost requires the advance approval of a responsible manager or supervisor. When the budget limit is reached, no further costs may be incurred unless authorization is given by a higher level of management. Most large companies set up a very detailed signature authorization matrix system to ensure that all indirect expenses are approved by the appropriate level of management before the expenses incurred. The financial function, usually on a routine basis, verifies the appropriateness of approval levels and authenticity of signatures.

The company’s management control system should provide a tracking capability for comparing actual performance with forecasts, interpretation of variances by responsible managers, and a system for readily communicating performance data to appropriate management levels. Given the large number of indirect costs in a variety of overhead pools with many managers involved in authorizing overhead costs for their respective organizations, it is critical that common, standardized reporting systems be administered to ensure the consistency and integrity of the total reporting system. Significant data relationships must be maintained, in order to have organizational “roll-ups” to higher levels of management. Also, it is essential that indirect cost control reports be submitted promptly, as they are of little value if received too late to take corrective action.

Although overhead pool managers are responsible for indirect cost performance, the reporting of actual indirect costs will occur at all lower levels of the business segment wherever budget accountability is assigned. In effect, each organizational manager is responsible for the expenditure of resources in the accomplishment of assigned overhead tasks and also must ensure that the assigned tasks are accomplished within specified and authorized spending lim-

its. Management and control of costs within those limits is supported by frequent and timely reporting of indirect costs as they are incurred, compared to targets that have been established for that reporting period. This reporting enables managers to measure performance and to make the necessary mid-course corrections, to adjust future spending to offset any adverse trends or unanticipated overruns. Consequently, reports must be in sufficient detail to reach the lowest level of indirect cost responsibility. Thus, performance reporting provides overhead pool managers, organizational managers, and top management with timely visibility on progress toward committed targets. Reports to the upper levels can eliminate some of the detail that is necessary for supervisors, but the reports must be in such detail that one can tell in which organizational unit the variances occurred.

Indirect costs are usually reported monthly, except for certain overhead costs, such as independent research and development and bid and proposal expenses, which are often reported weekly. These two very large costs can be burned up quickly if not controlled in a highly disciplined manner. Indirect cost reporting is usually done on both a current month and year-to-date basis, with an assessment of any at-completion impacts. Monthly indirect cost management meetings are usually held by pool managers with responsible organizational managers. Often, monthly management councils or committees are formed solely for the purpose of reviewing indirect costs each month. Usually, at a minimum, indirect cost reviews are held with members of top corporate management on a quarterly basis to review the status of indirect costs.

The specific format for indirect cost control reports is different for each contractor, based on its perception of the information necessary to understand progress made toward achieving established overhead rate commitment and bud-

get targets. But generally, contractors provide three primary reports to managers that show on a monthly and year-to-date basis a comparison of the planned and actual overhead rates, overhead expenses, and direct allocation bases. Exhibit 12, "Rigorous Monthly Overhead Variance Analysis," gives an example of the type of information that would be shown on a typical overhead report. This data is often shown graphically for management presentation purposes.

The chart is shown at the overhead pool level, but realize that this same comparison information is reported to each lower level organizational manager within the overhead pool, with each of the hundreds of separate indirect expenses separately identified. Individual cost center managers are then called upon to justify variances from planned costs. In addition to the reporting of specific overhead expenses, the reporting of the direct cost allocation base data is essential to monitor overhead rate performance. Although overhead pool and organizational managers have control of specific overhead expenses incurred in their organizations, they do not necessarily control the base over which their overhead costs are absorbed. For example, the head of the engineering calibration department may control the level of indirect employees in his department, but it could be the head of the engineering test department who controls the number of pieces of equipment requiring calibration as well as the timing and availability of equipment. This split in responsibility can lead to loss of control and enormous people problems unless management follows a tough cost control philosophy. Quick management action may be required to adjust spending levels to respond to changes in the allocation base, which can significantly affect the overhead rate.

Usually the computerized indirect cost control system processes monthly, but indirect labor in

each overhead pool is typically so significant that head count information may be looked at on a “by name” basis, weekly, or even daily. The importance of closely monitoring indirect head count cannot be overemphasized in controlling overhead costs.

VARIANCE ANALYSIS

Once the work is well under way, organizational managers have a continuing responsibility to justify to overhead pool managers the variances of actual performance with budget targets. An essential component of the overhead control process is a variance analysis of numerous cost drivers and cost elements when performance reporting reflects out-of-tolerance conditions. Variance analysis is accomplished in order to obtain a more in-depth understanding of differences between planned and actual performance and to enable management to better forecast future performance. These assessments also enable management to direct corrective action plans to compensate for past or future adverse performance to budget targets.

The total variance in overhead costs for a month is usually made up of several variances, some of which may be favorable and some unfavorable. Variances are termed favorable when actual costs are less than budgeted costs and unfavorable when actual costs are greater than budgeted costs. Managers analyze significant variances to determine the cause and to take appropriate corrective action. The criteria for “significant” varies by company. A rather common criteria at the overhead pool level seems to be a cumulative dollar variance for each overhead expense account of more than \$100K or more than 5% of the budgeted amount. Written explanations are usually required by management to explain these significant variances.

Variance analysis probes the reasons behind differences between performance targets or

spending plans and the true incurrence of cost. Many reasons exist for such variances, such as changes in activity scheduled, more or fewer resources required to accomplish the original plan, and changes in resource costs (i.e., labor rates, travel costs, material costs) versus planned resource costs. An analysis of an unfavorable variance in indirect labor worked in engineering, for example, may show that the variance was caused by a combination of overtime worked at premium pay, a larger number of workers on board than planned, and the use of workers in a higher labor category than planned. An unfavorable variance in indirect materials in the assembly area may be analyzed to show the cause of variance is due to the use of excessive quantities by new employees, an inferior type of material purchased, or the purchase of higher priced material than budgeted for. This information must be communicated quickly and a continuous followup undertaken before the unfavorable trends or tendencies develop into large losses. If overhead rate variances are very significant, the overhead pool budget may require revision. Quite often, this will be the case when the company experiences a major fluctuation in the forecasted business base.

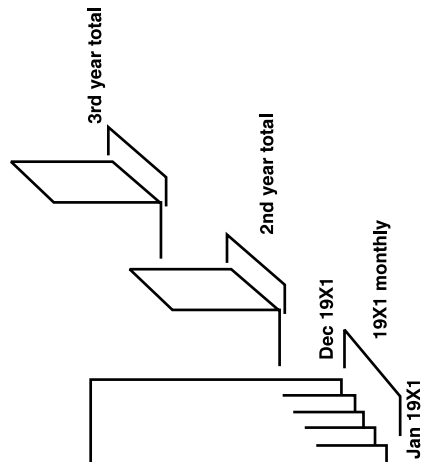
RATIO ANALYSIS

Defense contractors typically use numerous ratios as managerial tools in analyzing and controlling overhead costs. Such ratios are mathematical relationships of indirect or overhead type costs that can logically be related to direct cost drivers or total costs. For example, a manager may know based upon his experience in a particular manufacturing operation that the “utilization ratio” for his direct labor employees should be approximately 78 percent of total labor, both direct and indirect. That is, on the average he expects an employee working in a direct labor capacity on the production floor to expend 78 percent of his time working direct-

OVERHEAD BUDGETS

Pool	Expenses	Base	Rate
Engr	\$	\$	\$
Fab	\$	\$	\$
Assy	\$	\$	\$
Tooling	\$	\$	\$
Mat Hdlig	\$	\$	\$
Prod "A"	\$	\$	\$
Prod "B"	\$	\$	\$
Off-Site	\$	\$	\$
G&A	\$	\$	\$

Current year by month



OVERHEAD VARIANCE ANALYSIS

Pool	Pool Expenses			Allocation Base			Rate		
	Actual	Plan	Var	Actual	Plan	Var	Actual	Plan	Var
Engr	231147	233070	1923	186931	185055	-1876	123.65%	125.95%	2.29%
Fab	461441	459294	-2147	216307	218597	2290	213.33%	210.11%	-3.22%
Assy	176137	174748	-1389	101322	104094	2772	173.84%	167.88%	-5.96%
Tooling	42835	42165	-670	25804	24289	-1515	166.00%	173.60%	7.60%
Mat Hdlig	196434	184445	-11989	1753095	1693812	-59283	11.20%	10.89%	-0.32%
Prod "A"	13354	12874	-480	11653	11566	-87	114.60%	111.31%	-3.29%
Prod "B"	22504	23966	1462	23710	23132	-578	94.91%	103.61%	8.69%
Off-Site	6610	5942	-668	10235	8674	-1561	64.58%	68.50%	3.92%
G&A	401667	398959	-2708	3449681	3259290	-190391	11.64%	12.24%	0.60%

Overhead
Actuals

Exhibit 12. Rigorous Monthly Overhead Variance Analysis

ing on jobs and 22 percent of his time doing various indirect or overhead functions that cannot be directly traced to specific jobs or contracts. Such indirect or overhead labor charges could include, among others, training, union activities, idle time, medical exams, and various leave charges such as sickness, vacation, military, and jury duty.

In many cases, the corporate office looks at various ratios as control tools and uses them for setting targets for overhead management purposes. For example, a corporate objective given to a business segment may be to improve the utilization ratio of direct labor from 78 percent to 82 percent in 1997. The ratios used may have been developed based upon the prior year's experience for the business segment or data from other business segments in the corporation.

Recognizing that overhead is made up of literally hundreds of different types of indirect expenses, these overhead control devices are usually not developed as engineered standards that use expensive industrial engineering methods, as one typically finds for direct labor and direct material costs. Usually, they are based on internally developed historical data for each company. In order to deal with the large number of relatively small indirect charges and to facilitate the analysis by examining ratios, contractors often summarize their overhead expenses by combining similar groups of accounts. The overhead classification and summarization process is unique to each company. For example, contractors may use terms such as "facilities support services," "shop support services," and "management support services" that sound similar but are in fact quite distinct. Large overhead cost classifications in one company, such as "unrestricted parts," "perishables," "miscellaneous small parts," may not exist in other companies. In effect, each company has an overhead business language of its

own. Therefore, some ratios developed for use in controlling overhead cost in one company would probably be of little or no value in another. In actual practice, some ratios used to control overhead costs may be based on managerial experiences of key personnel who have found that certain ratios have proven profitable and efficient. The historical data base could be personal in nature, may have originated when the individual worked at another company, and may not be written down anywhere.

TREND ANALYSIS

Trend analysis greatly facilitates the analysis of overhead costs. One of the principal uses of this technique is for identifying early departures from historical patterns over time. Trend analysis enables one to detect unfavorable trends or correlations and allow attention to be focused on certain more significant indirect expense accounts or organizations that appear to be getting out of control. For example, if an indirect cost, such as the use of miscellaneous small parts in the assembly area, has been found in the past to vary proportionately with assembly direct labor, one would expect current use of these items to bear the same or similar relationship. A more detailed investigation will then be required to determine the specific causes of the departure from normal operations. For example, an increase in the miscellaneous small parts usage ratio could be caused by inexperienced employees who recently "bumped" into certain assembly jobs as a result of compliance with union contract requirements, or it could be caused by parts of inferior quality bought from a new vendor. By thus isolating indirect costs that need special examination, one is able to provide a means for improving the control over overhead. Another important use of trend analysis is in forecasting overhead costs. Such forecasts assume that relationships observed in the past will continue in the future. They are most likely to be reliable when they are within the

general range of the historical data. If changed conditions or circumstances are predicted, such as operating efficiencies or changes in plant location, overhead projections based on historical data may require adjustment to reflect the related changes in expected costs.

As we discussed in an earlier chapter, overhead expenses are often divided into fixed and variable cost components based on the pattern of behavior of the costs over production or volume. From an overhead cost control standpoint, a comparison of the dollar amounts for fixed costs incurred over time may prove beneficial. These expenses should remain about the same from one period to the next. As an example, the cost of depreciation charged to the fabrication shop and the equipment within the shop usually would not be expected to vary by much simply because the company forecasts an increase in fabrication work for the coming year. The difference in forecasted cost of depreciation and the prior year's depreciation could be for such factors as asset purchases and retirements, differences in depreciation rates, or organizational changes. It is possible that there could be very few or no differences if straight-line depreciation was being used and no new equipment was being installed. This kind of comparison can often identify errors made in and recording overhead costs. Such dollar comparisons from one year to the next are a useful tool to evaluate other overhead costs, particularly the capacity-related costs such as rent, lease, insurance, real estate taxes, and property taxes. However, if contractors are making significant changes in their fixed assets, a very detailed fixed asset tracking system is usually required to ensure that overhead costs are properly accounted for and controlled.

MANAGEMENT METRICS

Based on discussions with personnel in the defense industry who are actively involved in ana-

lyzing overhead costs, several overhead management indicators or metrics have proven to be effective in identifying overhead control problems.

Indirect labor is usually one of the largest cost elements categorized as overhead in most overhead cost pools (i.e., engineering, fabrication, assembly). The ratio of indirect labor costs to total overhead costs in each cost pool is a common overhead metric and it often accounts for one quarter or more of all overhead costs. Many believe that if you can control indirect labor, you control overhead. Consequently, in most companies, the authority for hiring any new indirect employee is often at a high management level.

Contractors often compute various factors for use of direct and indirect labor. These are often unique to a company, but a rather common method for computing a utilization factor is to compute the ratio of indirect labor, after subtracting out vacation and leave time, to direct labor. Some contractors also compute effectiveness factors of total indirect labor divided by total direct labor. Overtime charges are often major contributors to overhead and are monitored very closely through the use of a ratio of overtime percentage worked for both direct and indirect employees. Idle, waiting, or nonproductive time is very closely monitored by the ratio of such time to total direct labor.

Indirect labor charges are numerous and highly varied in nature, and if a detailed cost analysis of the charges is required, these costs must be broken down into logical components. For example, the compensation of managers, secretaries, supervisors, leadmen, and various administrative support personnel in each overhead pool may be found in indirect labor charges. Such costs must be identified by labor category, by functional organization, and analyzed into variable and fixed components. The ratios of

each category to the overhead allocation base, such as direct labor dollars, can thus be computed and compared with similar historical ratios used for overhead forecasting.

The analysis of head count information is thought to be extremely important and is widely used by defense contractors in controlling overhead costs. Monthly and weekly reports are usually provided to management that cover all aspects of manpower status. Overhead cost control information typically supplied includes the ratios of management to nonmanagement employees, professional to total employees, indirect to direct employees, hourly to salaried employees, contract or purchased employees to total employees, and leadmen to production workers. The current status of any new employees to be hired is very closely monitored, often on a daily basis.

Fringe benefits usually are included in overhead cost and include the benefits for both direct and indirect employees. A separate analysis of fringe benefit costs is usually made for hourly and salary employees because they often have different benefit packages. These costs are very significant and may account for as much as one-half of regular pay for all employees. For overhead cost analysis purposes, contractors typically break down fringe benefits as a percentage of total salaries and wages with a separate ratio computed for the costs of health care, workers' compensation, pensions, life insurance, sick pay, vacation pay, holiday pay, savings plans, and social security taxes.

Capacity- or facility-related overhead costs, such as depreciation, maintenance, insurance, and property taxes, are often monitored based upon a ratio of cost per square foot of occupied space. Other typical management tools include looking at the square foot occupancy per employee, telephone lines per employee, repair and maintenance per machine hour, power cost per

operating hour, and equipment downtime per operating hour.

Overhead metrics used in the materials overhead area (often called materials handling) include total people working in the materials handling function as a percentage of total company employees, materials handling cost per unit shipped or received, freight cost per unit shipped or received, shipping and receiving per ton handled, number of people in purchasing as a percentage of total materials purchased, and purchasing costs per purchase order. Examples of other significant overhead costs that are monitored using metrics are quality assurance as a percentage of production, computing cost per employee, training costs per employee, travel cost per employee, consumable supplies per direct labor hour, perishable tools per direct labor hour, office supplies per employee, and graphics cost per employee.

In analyzing general and administrative expenses, several ratios are used because of the broad nature of this expense pool. Examples are general and administrative expenses as a percentage of sales, personnel classified as general and administrative as a percentage of total company personnel, and employees in contracts, accounting, legal, and human resources as a percentage of total employees. Certain large administrative expenses are tracked with ratios such as personnel cost per employee hired, billing cost per invoice processed, and payroll costs per employee serviced. Selling and marketing expenses are often broken down into direct selling and sales administrative or support expenses and separately monitored as percentages of sales or profit. Order processing is sometimes reviewed based on cost per order processed. Independent research and development and bid and proposal expenses are large indirect-type expenses, usually classified as general and administrative expenses, that are often tracked based on ratios such as cost as a

percentage of sales or profit, cost per product sold, cost per value of new contracts received, or cost per employee.

Contractors frequently prepare graphs to identify overhead cost trends and departures from historical patterns for attention of management. Typical of such graphs are both estimated and actual plots over time of monthly and cumulative overhead rates, overhead expense dollars, and overhead allocation bases. Other graphs often prepared monthly because of the significant dollars involved are estimated and actuals for independent research and development expenses, bid and proposal expenses, indirect labor, and employee head count.

The use of various overhead ratios or metrics, along with trend analysis, provides a ready means of focusing attention on those costs that are deviating from experienced trends and that require some degree of special investigation. It should be emphasized that overhead metrics cannot be used blindly. Often there are other factors that may have a significant meaning when comparing ratios, such as changes in production methods or processes, organizational changes, changes in employee classifications (direct or indirect), certain unusual or nonrecurring costs, inflationary factors, and accounting changes.

REGRESSION ANALYSIS

The statistical technique of regression analysis is sometimes used in managing indirect costs. A detailed mathematical explanation of the technique is beyond the scope of this guide; however, we can briefly summarize how it may be applied in the analysis of overhead costs. Regression analysis is concerned with deriving mathematical equations that express certain functional relationships among variables, such as the relationship of an indirect cost (a dependent variable) to a direct cost allocation base

(an independent variable). Statistical correlation data provides information for evaluating how closely the dependent and independent variables are related. Commercial software packages now available perform regression and correlation analysis computations.

Simple regression analysis, so named because it only has one independent variable and one dependent variable, is sometimes used for forecasting overhead costs. The independent variable could be any direct cost, such as direct labor dollars, direct labor hours, or machine hours, and the dependent variable would be overhead costs. As an example, the overhead forecast in a manufacturing overhead pool could be expressed by this mathematical equation derived through regression analysis:

$$\text{Forecasted overhead} = \$1\text{M (Fixed cost)} \\ + (\$2.6) \text{ (Forecasted machine hours)}$$

The \$1M of fixed overhead cost would occur at zero machine hours while the coefficient of (\$2.6) would be derived from the slope of the regression line computed based on historical statistics.

Multiple regression analysis is often more accurate than simple regression analysis. It involves evaluating the relationship between a dependent variable, such as overhead costs, and two or more independent variables. It is used in those cases where the cause and effect relationship based on a single independent variable is found to be insufficient. Multiple regression analysis could be used, for example, to forecast manufacturing maintenance hours based upon the variables of production direct labor hours, machine hours, and square footage of production floor space serviced by maintenance personnel.

An application for regression analysis could be to test for reasonableness of estimated overhead

rates forecast for many years into the future. Overhead rates vary in response to numerous causes but because many overhead costs are fixed (as discussed in Chapter 2 involving cost behavior), the level of predicted operations is very significant. Overhead rates usually are lowest when a facility is operating at capacity, and increase substantially when operating levels are reduced. This relationship becomes significant in forecasting overhead costs for large programs that involve performance over long periods. In these cases it is necessary to predict overhead rates many years in advance on the basis of operating levels projected for these years.

Regression analysis is also used for testing the reasonableness of the relationship of a certain direct cost, such as direct labor hours or machine hours, as the basis for allocation of overhead to cost objectives. The direct cost allocation base should be a primary cost driver or an activity that causes the overhead cost to be incurred. In other words, there should be a strong causal relationship between the direct cost allocation base used for allocation of overhead and the overhead costs incurred. Although there will probably never be a perfect correlation between any overhead pool and any direct cost allocation base, some allocation bases will provide a higher degree of correlation than others. One of the statistics provided by regression analysis, the coefficient of determination, measures the extent of the relationship between two variables. The value of the coefficient of determination is always between zero and 1. The closer the value is to 1, the stronger the relationship between the two variables. The higher the correlation, the stronger the linkage of indirect costs to direct cost, thus providing a more accurate allocation of overhead.

Based on discussions with industry personnel who are actively involved in managing overhead, we find that regression analysis is not used

extensively for forecasting defense contractor overhead because of the volatile nature of the business. The use of regression analysis assumes that overhead costs will be the same in the future as the past. If a change in cost behavior of an expense is foreseen, regression analysis applied to historical data will not provide useful results and some other method of forecasting should be used. In other words, what one knows about the future is far more important than the prior historical data. Statistical techniques are highly valid in characterizing prior history but they cannot foresee the future. In the opinion of industry personnel we interviewed, constant changes in the defense business—such as large swings in the business base, technological changes, manufacturing process changes, creation of new functions, transfers of functions between overhead pools, reorganizations, and acquisitions—create numerous problems in obtaining meaningful overhead forecasting results with regression analysis. Consequently, judgment and experience combined with an analysis of future program requirements are considered far more valuable than statistical techniques for forecasting overhead. In practice, regression analysis is used more for testing the reasonableness of other forecasts developed by management.

INDUSTRIAL ENGINEERING ANALYSIS

We have already stated that one of the largest costs included in all overhead pools is indirect labor. Such costs may be so significant as to warrant special study or review. One of the best ways to analyze and control indirect labor costs is to use the industrial engineering staff, assuming that the benefits would clearly outweigh the costs. Industrial engineers can be called upon to analyze the indirect tasks performed in various indirect functions similar to the way direct tasks are examined on the production floor. Defense contractors sometimes use industrial

engineering techniques in the study of various indirect and production processes with the objective of improving the efficiency of their operations and activities.

Industrial engineers use scientific methods, such as time study, work sampling, and standard data, in evaluating specific indirect labor functions performed by various departments. The analysis is output-oriented, with an emphasis on the identification of non-value-added activities. Essentially, industrial engineers are determining if certain indirect functions are necessary, desirable, or simply nice to have. They are also concerned with analyzing how the functions are currently being performed and whether the most efficient methods are being used. The engineering analysis of indirect or overhead type functions could well lead to savings as a result of: combination of certain functions, simplification of work processes, elimination of administrative bottlenecks, elimination of unnecessary equipment, reduction of reporting requirements, introduction of automation, and decisions to purchase rather than buy services. A fresh, independent, and objective look at overhead is often desirable because indirect functions are sometimes originally staffed based on meeting peak workload requirements. Consequently, indirect employees may not be efficiently used when normal operations are resumed or when there is a reduction in operational requirements.

CONTRACTOR ACTIONS TO REDUCE OVERHEAD

Our research efforts showed that defense contractors are very concerned about increasing overhead rates. Generally, there has been a severe deterioration of the business base, which naturally causes a significant increase in overhead rates. Contract terminations and major quantity reductions that have occurred in the last few years have significantly affected over-

head rates, and remaining contracts have been forced to absorb additional overhead costs. As we have previously discussed, that is the way indirect or overhead cost allocation works. There is current defense contractor management concern that high overhead rates could cause additional increases in weapons systems costs and result in further program reductions in the future. Each of the contractors we interviewed in our research efforts has faced severe problems in managing indirect or overhead costs. Overhead costs, which are often linked to capital assets, simply cannot be eliminated quickly. Vacating leased space, consolidation of functions, and possibly, even the selling of land, buildings, and equipment, takes time. Large, defense-oriented facilities often do not have multiple uses, and a marketability problem usually also exists because of the local economic impact of defense program cutbacks.

Defense contractors realize that overhead costs must be reduced in order for them to be competitive, and they are serious about cutting these costs. Each contractor we interviewed has had to make tough decisions involving people, many of whom have worked for them for decades. It is not uncommon for a defense contractor to have lost one-half of his people and one-half of his business base within the past three to four years.

In order to deal with the critical overhead problem, all of the defense contractors we interviewed had set up special project teams to study what could be done to reduce these costs. Special efforts were made to ensure that the teams were interdisciplinary in nature with all organizational elements and functional areas represented. Generally, the teams included lower level managers, or those being burdened with overhead, as well as upper level managers. Efforts were made to encourage team members to get out of a "stovepipe mentality" and to take an objective, fresh look at the problem from a

total company perspective. In some cases, the teams were given specific targets by top management as to certain overhead cost reductions that had to be achieved.

The recent approaches used by defense contractors in cutting overhead costs have been genuinely innovative. Some contractors instructed their teams that a totally new way of thinking about overhead costs was required, instructing overhead study team members that “there is no such thing as a noncontrollable cost! If you, as operational managers, cannot control overhead, who can? There is no such thing as a fixed cost! Nothing is fixed, we can eliminate it. There is no such thing as an allocated overhead cost that you must accept! The control of overhead cost is the responsibility of the person being charged with it!” Lower level operational managers were told that no cost is free and that overhead is not peanut butter to be spread out. Managers were instructed that if they did not accept any overhead cost allocation as being worth the amount allocated to them, they were authorized to go back into the organization allocating the cost and see what could be done about reducing or eliminating it! Essentially, management was directing the project teams to challenge every indirect function performed and to recommend to them, using a bottoms-up approach, what could be done collectively to cut overhead.

The focus of the detailed studies of overhead was to dissect the hundreds of indirect expenses and to identify why the cost was incurred. Efforts were made to identify indirect function “core competencies” and to eliminate any non-value-added functions or activities. Loral Imaging Systems went a step further and analyzed overhead functions to pinpoint for management awareness those specific indirect tasks that would no longer be performed if cost-cutting targets were met.

Some contractors have made concerted efforts to examine the various overhead or indirect cost-oriented business processes within their corporations with the objective of identifying similarities, differences, and efficient or inefficient practices at various business segments. For example, the Boeing Defense and Space Group, as part of its overhead study efforts, conducted a rigorous review of internal practices within its five major divisions, with the objective of identifying the “best in class” for certain functions. The analysis was made of functions such as manufacturing support, materials handling, quality assurance, inventory control, billing, scheduling, and the business process used for managing overhead itself. The “best in class” analyses have resulted in significant productivity improvements and overhead cost reductions. In addition, the wide-scale efforts have promoted management objectives of standardization, consistency, and continuous improvement.

Special projects to study overhead in many companies resulted in management decisions to purchase certain services that traditionally had been performed in-house. Examples of such services that were previously performed as overhead functions, but are now being partially or totally purchased at lower cost, are data processing, travel management, processing of insurance claims, legal services, photography and graphics, janitorial services, upkeep of grounds and roads, cafeteria operations, and guard services. We were advised that the initiative to purchase such services from outside sources also gives defense contractors greatly increased management flexibility by converting large, fixed cost, overhead elements into a more variable cost. In some cases, the requirement for security guards was eliminated entirely with the installation of automated security systems.

Numerous efficiencies and reductions in overhead costs have been brought about as a result

of overhead study team efforts to consolidate various operations. Consolidation and reorganization efforts have resulted in the sharing of resources through the combining of support functions, such as transportation, facilities engineering, security, procurement, finance, and human resources. Marked reductions have taken place through the elimination of indirect employees as a result of reductions in supervisory and management personnel, and other indirect functions, such as various staff and service activities in engineering and manufacturing. Indirect labor is considered to be the initial target for overhead cost reduction since it is such a large cost driver. Contractors have been very actively involved in consolidating computer and data processing centers. The number of locations and major data processing systems have been combined in many cases to effect overhead cost savings. In addition, various data processing functions within engineering, operations, and finance that have been operating independently are now consolidating to become less costly and more efficient. The combining of computer centers has resulted in the reassignment and release of computer equipment, thus reducing depreciation cost. Boeing was able to effect large savings in overhead by closing or consolidating numerous engineering laboratories. The sharing of resources and consolidation efforts resulted in reducing the number of labs by more than 60 percent in a four-year period.

A concentrated effort has been made to identify and eliminate facilities that are not optimal. For example, Sikorsky made certain consolidations in their feeder plants, transportation, and warehousing activities that significantly reduced their square footage requirements for materiel functions. They also substantially reduced the number of indirect employees in transportation functions. Concerted efforts have been made to eliminate leased space, transfer buildings to corporate commercial segments,

and to sell some facilities, if possible. As an example of these efforts, Pratt & Whitney has made considerable progress by reducing their leased space by more than 50 percent within the past four years.

Contractors have also effected overhead cost savings and increased the utilization of assets by vacating buildings. The result is the reduction of heating, air conditioning, and maintenance expenses until the space can be utilized, subleased, or leases terminated. In addition to vacating numerous buildings, contractors are also reducing individual space allocations for their employees.

One would expect to see further consolidation efforts to reduce overhead and increase efficiency. These efforts could include the consolidation of overhead pools. A future problem may very well be in manufacturing overhead-related pools, because large-volume defense production work has been significantly curtailed. Recent defense contractor acquisition and merger activity will probably increase major consolidation efforts between as well as within companies.

Efforts to reduce overhead cost often mean staff cuts. Companies offer incentives for early retirement, reduce the number of indirect employees by increasing the span of control of supervisors and managers, eliminate overtime pay for salaried employees, defer or lengthen the period for pay increases, and eliminate some holidays. In order to reduce overhead but still not lose key experienced employees, Pratt & Whitney was able to furlough certain employees, particularly in the test areas, for a period of several months. Sikorsky was able to reduce fringe benefits by introducing flexible benefit plans. These plans provide a framework whereby an employer can control or cap cost growth by limiting the allowances provided to the employees to purchase benefits, while giv-

ing the employees some flexibility to tailor benefit packages to their own individual circumstances. Often, the flexible benefit allowance doesn't totally cover benefits purchased under the flexible plan and the employee contributes to the costs through payroll deductions.

Defense contractors have made many efforts to reduce overhead costs through better management of employee medical expenses. Most significantly, efforts have been made to increase employee contributions through payroll deduction, increase deductible amounts, increase copayment amounts, encourage employees to shift to lower cost HMOs, require second opinions for some surgeries, and give employees incentives to choose preferred providers with their less expensive negotiated rates. In one case, at the suggestion of employees on special overhead study teams, on-site doctors and nurses were eliminated in order to cut overhead costs.

Other overhead cost containment measures have included substantial reductions in travel expenses, training, perishable tools, outside services, use of voice mail to reduce secretarial support, elimination of executive dining rooms, increased use of teleconferencing, elimination of copiers and telephones, and energy conservation measures. As a result of overhead study team recommendations, special management approval is now often required in advance of incurring certain overhead expenses.

There has been a strong effort by defense contractor management to constrain capital spending in order to reduce overhead costs. It is not unusual for defense contractors to have cut capital spending by 50 percent or more within the past three to four years. It is very difficult to get a large capitalized project approved in the current environment; often it must be for asset replacement or for safety reasons. At best, de-

fense contractors expect capital spending to remain flat for the next several years.

To cut their general and administrative expenses, most defense contractors have significantly reduced their IR&D and B&P expenses. Since new programs and bid opportunities are minimal, there is a strong conservation of IR&D and B&P discretionary funds. Companies are now focusing on core technologies and pursuing projects in only those areas. It is getting much tougher to get new projects approved and generally, they must be related to an existing product line. For example, the Loral Imaging Systems Division recently set up a "strategy board" to review each project in detail prior to approval. Since IR&D and B&P expenses are usually included in the G&A expense pool, the president of the company is often the person responsible for reducing this overhead cost.

Defense contractors are now making significant efforts to achieve more direct identity of costs by reclassifying employees from indirect to direct to provide more visibility and control. Examples of such functions that are being changed in some companies from indirect to direct charging functions are program management and administrative support, cost schedule and control, engineering administrative support, industrial engineering, expediting, dispatching, and certain production liaison functions. Of course, companies differ significantly as to how they individually classify these functions. Some companies are also moving fringe benefits from being an indirect cost to being a direct cost for salaried, hourly, and contract job shop employees. The shift from indirect to direct will have a significant impact on reducing overhead rates, because the labor will be in the cost allocation base, or denominator, rather than in the indirect overhead cost pool (numerator). As we have previously discussed, such shifts from indirect to direct do not reduce total cost, but defense

contractors feel that it improves the accuracy of cost allocations.

We were advised by upper levels of management that the special project, large-scale study efforts were very beneficial, producing many cost cutting ideas. The study team approach was also instrumental in educating employees about the importance of controlling the many indirect costs and in establishing a sense of responsibility for overhead at lower operational levels. After the special projects were completed, many employees have continued to voluntarily come forth with overhead cost-cutting ideas. but while the bottoms-up, special project team approach was useful, it simply did not cut overhead enough.

We were advised that although actions to cut overhead costs through the bottoms-up approach were ambitious and aggressive, a top-down approach was necessitated by the urgency to make major overhead cost reductions. DoD budgetary forecasts called for additional reductions in the business base, and given this downturn, defense business segments were receiving increasing pressure from the corporate office on profitability concerns.

Each of the contractors interviewed had to iteratively continuously cut overhead costs and reduce rates in order to be competitive. So overhead cost reduction was placed directly on the plate of top management. Given the limited opportunities for winning additional business, top management capped overhead at certain rates deemed necessary to maintain competitiveness during expected lean times in the future.

To maintain a strong emphasis on reducing overhead and to elevate the sense of urgency of competitive overhead rates, most contractors have set up highly visible “control rooms.” Given attention-getting names such as “Break-

through Room,” “Room X,” “Engineering Overhead Control Room,” or “Management Control Room,” they are established to conduct overhead reduction team meetings and for posting a myriad of data relating to cost control. Typically, on a monthly basis, contractors post on the walls of the control room large charts that show the current month and year-to-date overhead performance for each overhead pool.

The Boeing Defense & Space Group (D&SG) took particularly strong steps to firmly establish accountability for managing overhead costs by designating specific executives as being responsible for each of its many overhead cost pools. Their view is that once executive responsibility for overhead is clearly established, more positive steps can be taken to improve the effective utilization of indirect activities. Each overhead pool in the Defense & Space Group organizational structure has an “owner.” The owner is the designated pool manager, normally a vice president, but always a senior operational manager, who is responsible for managing the pool and achieving the committed performance levels. It is interesting to note that pool managers are operational personnel and not financial personnel. This indicates that a significant change has occurred: Senior operational managers, not financial personnel, are required to explain variances in overhead to top management. A significant factor in evaluating management performance and in determining incentive pay is the ability to manage overhead costs. Financial personnel assist each of the overhead pool managers in interpreting and explaining accounting systems and data, but operational managers are the ones accountable. An “Overhead Pool Responsibility Matrix” is maintained by D&SG to ensure the proper assignment of responsibility for pool management and an individual called a “finance focal point” is designated to assist the overhead pool manager by providing accounting support. Each overhead pool manager is accountable to se-

nior D&SG management for performance to internal organizational overhead budgets and is committed to achieving the overhead rates. Overhead pool managers and finance focal points are responsible for documenting and supporting the accuracy, currency, and completeness of their overhead forecasts and for providing justification for the various calculations and values contained in rate computations. It seems that the practice of involving operational personnel in overhead management is exceptionally beneficial, since such a large number of indirect costs are discretionary in nature and considerable management judgment is required. Senior operational managers have the knowledge and experience to make tough decisions that financial personnel do not have.

Recently, the concern for “affordability” of overhead rates has lead to a relatively new management philosophy regarding the control of overhead costs. The new concept is referred to by some as the “100% variability of overhead rule”: There is no such thing as a fixed cost and overhead does not have to be carried if the business base declines. Stated differently, all overhead costs should be viewed as variable costs and if the business base declines by 20%, overhead cost must also be reduced proportionately, or by 20%, in order to “hold the rate.”

The concept represents a direction from top management that overhead pool managers must be committed to maintaining a constant overhead rate in order for the company to be competitive. In other words, they cannot afford for overhead rates to go any higher. If the business base is reduced, overhead pool managers must find ways to cut overhead costs a sufficient amount to keep the rates from increasing. For example, suppose that the current manufacturing overhead rate is 200% derived by the indirect manufacturing overhead expenses of \$400M divided by a direct labor dollar base of \$200M. The indirect overhead expenses are

made up of fixed costs of \$160M and variable costs of \$240M. Therefore, the variable overhead is \$1.20 for every \$1 of direct labor or \$240M divided by \$200M. Consider that the contractor loses a major contract and the business base is reduced by \$60M for a 30% reduction in burdenable direct labor. Traditionally, the new forecasted manufacturing overhead rate would normally be expected to jump to 234% derived by dividing the new forecasted overhead costs of \$328M by the new direct labor base of \$140M. The new base would be 70% of \$200M or \$140M. The new overhead pool expenses would be made up of fixed overhead of \$160M plus the revised variable overhead of \$168M (revised base of \$140M times the variable overhead rate of \$1.20 per direct labor dollar). However, under the concept of the “100% variability of overhead rule,” the overhead rate must be held constant at 200% in order to be competitive. This means that fixed costs must be cut substantially to make this happen. In fact, fixed costs would have to cut by \$48M, a formidable task. However, the ultimate goal of management is to treat fixed costs and semivariable costs as totally variable costs.

Although there can be approved exceptions to the rule in some circumstances, it is clear that top management expects overhead pool managers to think in terms of 100% variability of overhead costs. Previously, overhead pool managers were held responsible for only overhead expenses. Now they are responsible for maintaining the overhead rate, which means that they are responsible for the business base as well as the overhead expenses. Some contractors report very favorable results with this concept. For example, if the business base declines, what can be done to offset it? If costs go up in one area what can be done to cut or trim overhead costs in other areas? In the past, managers tended to manage by direct labor hours; now they manage to a rate and as a result an increased emphasis must be placed on overhead.

We were told that “holding the overhead rate” has been incorporated into management score cards. Whether this concept is achievable remains to be seen; however, it certainly creates tremendous pressure on managers to focus on overhead cost control.

Some contractors report that there has been somewhat of a cultural change in dealing with the government in connection with managing overhead. They are working more closely with the government on the joint objective of avoiding any major surprises involving increasing overhead costs. In some cases, government personnel from the local DCMC cognizant office meet on a regular basis with overhead pool managers at the company’s monthly overhead meetings to discuss reasons for cost variances. Previously, the contractor had mailed certain overhead reports to the government for review. A significant improvement in maintaining currency regarding overhead problems has been noted by government personnel and a more open, trusting relationship between the two parties seems to exist. In addition, contractors report that government people seem to be more

focused on understanding their business processes as a means of monitoring overhead costs rather than relying on reports previously created for their use.

In summary, it is apparent that defense contractors are very concerned about the significant problem of a drastically declining business base and the resultant impact on overhead rates. The problem could, if not addressed by management, result in increased costs to program offices on flexibly priced contracts and spiraling, noncompetitive, overhead rates for defense contractors. Contractors have studied and continue to study what can be done. They are cutting overhead costs, reducing their workforces, eliminating excess capacity, and consolidating operations. Significant reductions are being made in discretionary spending through cuts in capital spending on plants and equipment, machinery and tooling, independent research and development, and bid and proposal expenses. Concerted efforts are being made to streamline operations by examining the best and lowest cost business practices in numerous functions throughout the corporation.